C. L. B. DE SAUNIER.

DOLL, LAY FIGURE, SKELETON, AND THE LIKE.

APPLICATION FILED MAY 20, 1918.

1,315,820. Patented Sept. 9, 1919.

Fig. 1

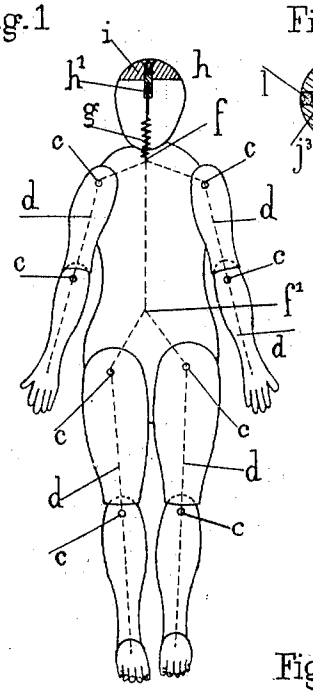


Fig. 10

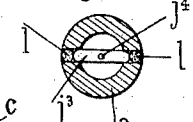


Fig. 2

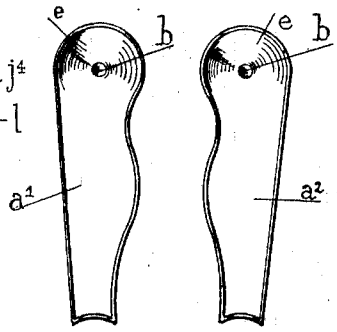


Fig. 7

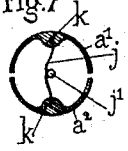


Fig. 8



Fig. 9

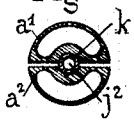


Fig. 4

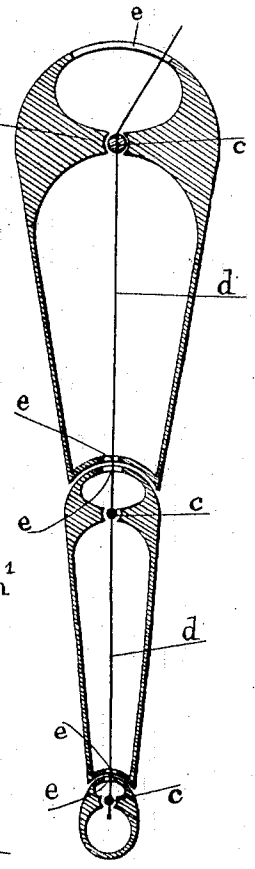


Fig. 3

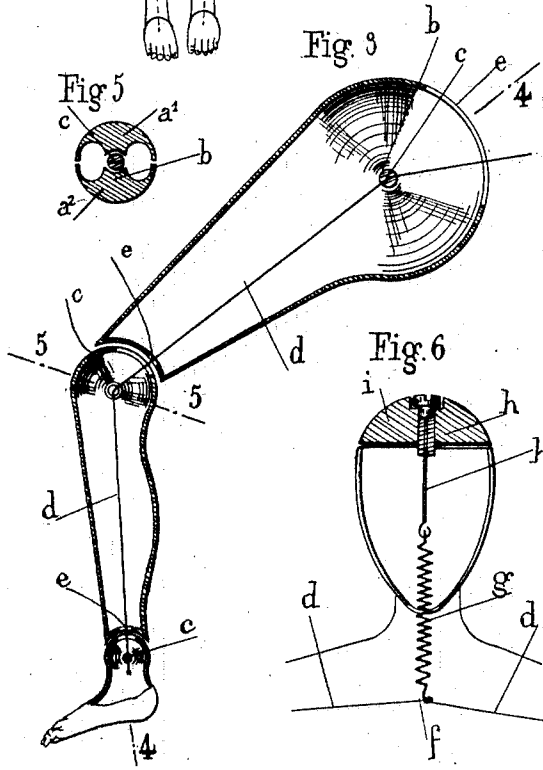


Fig. 5

Fig. 6

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DOLL, LAY-FIGURE, SKELETON, AND THE LIKE.

1,315,820. Specification of Letters Patent. Patented Sept. 9, 1919.

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To all whom it may concern:

Be it known that I, CHARLES LOUIS BAUDRY DE SAUNIER, a citizen of the Republic of France, and a resident of Paris, France, have invented a new and useful Improvement in Dolls, Lay-Figures, Skeletons, and the like, of which the following is a specification.

In order that the articulation of dolls, manikins, lay-figures, skeletons and the like representations of the human or animal body should be done correctly and easily and in order that their limbs held in contact or position by springs should maintain the exact positions given to them, it is necessary that the movements of these limbs should not alter either the strength of these springs or the direction of pull of said springs; it is necessary that no position should increase or diminish the tension of the springs and that it should not change the balance of the forces in action.

This double condition is realized if the line of pull in the assembly of the limbs passes always through the center of the spheres, part-spheres, knee-joints and the like which serve for articulation purposes; if in short the flexible connection which joins the limbs, passes always over an axis or in a guide which whatever be its position, holds it in the actual center of the articulation or joint. One can then effect the mounting or assembly by means of cords or cables passing through all the limbs but tensioned by a single spring, of which the movements of the limbs cannot alter the tension.

The annexed drawing shows, by way of example, a method of carrying out the above conditions.

Figure 1 is an elevation of a doll showing the whole of the cord-system. Fig. 2 is a side view of two shells which, when placed together, form a leg. Fig. 3 is a longitudinal section of three sections or elements (foot, leg, thigh) assembled together. Fig. 4 is a longitudinal section on line 4—4 of Fig. 3. Fig. 5 is a cross section on line 5—5 of Fig. 3. Fig. 6 is a vertical section through the head and showing the screw for mounting and tensioning the system of cables or cords. Figs. 7, 8, 9 and 10 are cross sections, similar to that of Fig. 5, and showing modifications.

Each of the limbs of a doll is composed, for instance, of two shells a^1 a^2 (Fig. 2) molded or stamped and then juxtaposed and soldered or stuck together; at the center of the articulation or joint a spherical cup b is provided in each of the shells and this cup may be obtained during the molding or stamping but care must be taken to give it a height less than that of the hollow part of the shell in order that it may not contact with the opposite shell when the shells are placed together. Between the two cups and before the shells are joined together, a small ball c is arranged, this ball being perforated diametrically. This ball can turn in any direction but its center always coincides with the center of the articulation in which it is situated. The cord or wire d which unites the limbs of the doll, passes through the ball; it thus remains always at the center of the articulation whatever be the respective positions of the two parts of the limbs which share this mutual articulation.

In order to permit of moving the limbs into any desired position without the cord deviating from its line of pull, it is necessary that there should exist in the spherical convex portion of each articulation, which is concentric with the ball, a space e sufficient always to allow a free passage to the cord. It is, therefore, convenient to form grooves or recesses of suitable width and size in the corresponding portion of the shells.

The branch cords for the various limbs meet at a point f (or at more than one point, for example at two points f f^1 as shown in Fig. 1) and the whole of the system of cords or other flexible connections thus formed is subjected to the tension of a single spring comprising an adjusting arrangement which can be situated at any part of the doll. In the example illustrated, this spring g is placed in the neck; the adjustment of this spring, the assembly and the dismembering of the doll are effected within the head of the doll by means of a screw h of which the head, sunk and concealed in the wig, while controlling the tension of the spring, maintains the cap or piece i which serves as a top to the head of the doll.

In order to permit of this adjustment, the screw h enters into a screw-threaded socket to which the tension spring g is hooked, or

the screw may be hollow and be connected to the spring by a screwed rod h^1 engaging its interior. The last-mentioned arrangement is shown on the drawing (Figs. 1 and 6).

The invention is naturally not limited to the shapes and details described and shown on the drawing, which can be varied as desired without altering its principle. Thus for example, the balls and their spherical cups can be replaced by wires j curled and socketed or loosely mounted in bosses k formed within the shells a^1 a^2 (Fig. 7), the loop k^1 thus formed being situated exactly in the center of the articulation. This very simple method corresponds in effect with that of the previous arrangement in which the diameter of the ball would be a minimum and this, from the point of view of theory, is the desired result to be attained. The central aperture might be formed by molding or stamping in the two shells or cheeks themselves as shown at j^2 in Fig. 8. This aperture or passage might, further, be furnished with an eyelet k of metal, bone, glass or the like pinched between the two cheeks or shells a^1 a^2 (Fig. 9). It is to be understood, the width of the aperture or of the eyelet is to be as small as possible.

One of the simplest methods of insuring the constant passage of the cord or cable to the center of the articulation consists (Fig. 10) in making in the sphere or ball-joint a diametrical hole of cylindrical shape into which is introduced with very slight friction an axis or shaft j^3 also cylindrical and provided at its middle portion with a small hole j^4 for the passage of the cord. This small axis is preferably shorter than the diameter of the sphere or ball and the spaces left at its extremities are filled in by keys or plugs l l which prevent the axis or shaft from sliding longitudinally. This arrangement is to be recommended for its simplicity; further, it permits of the limbs of the doll or of the lay-figure being made in a single piece a and not in two shells as previously illustrated.

In place of the inextensible cable or cord, an extensible flexible connection may be employed, or I may interpose in the cord or cable system, cushioning-springs or compensation-springs, without modifying the principle of unity of the tension spring. Again, I might, in case the construction permitted extremely small central guides to be employed, dispense with any spring and content myself with exerting on the cables, by means of the screw above described, or of a suitable hooking of the final wire of the system stretched over a fixed point, a pull which remains constant irrespective of the movements of the limbs.

Claims:

1. In a doll or the like, articulated members, a flexible member passing through the joint between said articulated members, and guide means for holding said flexible member at the center of articulation irrespective of the relative angular position of the articulated members in all directions of displacement.

2. In a doll or the like, articulated members, a flexible member passing through the joint between said articulated members, and guide means for holding said flexible member at the center of articulation irrespective of the relative angular position of the articulated members, said articulated members having a free way for the flexible member at the joint to permit the articulated members to change their relative position in all directions while maintaining the flexible member in its normal position.

3. In a doll or the like, a series of articulated members, flexible connections passing therethrough, means for maintaining said connections at the center of articulation at each joint irrespective of the direction of relative displacement of said members, and a single spring common to said connections for maintaining the same under tension.

4. In a doll or the like, a series of articulated members, flexible connections passing therethrough, and a single spring common to said connections for maintaining the same under tension, together with means for adjusting the tension of said spring.

5. In a doll or the like, a series of articulated members, flexible connections passing therethrough, and a single spring common to said connections for maintaining the same under tension, together with means at the head of the doll or the like for adjusting the tension of said spring.

6. In a doll or the like, a series of articulated members, flexible connections passing therethrough, and a single spring common to said connections for maintaining the same under tension, together with a head piece, and means associated therewith and operatively connected to said spring for holding said head piece in position.

7. In a doll or the like, a series of articulated members, and interconnected flexible means uniting said members, said uniting means passing through the joint between adjacent members substantially at the center of articulation, and means for maintaining said uniting means at said center irrespective of the relative positions of said members.

8. In a doll or the like, a series of articulated members, and interconnected substantially inextensible flexible means uniting said members, said uniting means passing through the joint between adjacent members substantially at the center of articulation, and means for maintaining said uniting means at said center irrespective of the relative positions of said members.

9. In a doll or the like, a series of articulated members, and interconnected substantially inextensible flexible means uniting said members, said uniting means passing through the joint between adjacent members substantially on the axis of articulation, and means for maintaining said uniting means at said axis irrespective of the relative position of said members together with spring means for holding said uniting means constantly under tension.

In testimony whereof I have signed my name to this specification.

CHARLES LOUIS BAUDRY DE SAUNIER.

Witnesses:
O. TAMECHON,
PAUL LIZE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."